

REMARKS

Claims 18-29 are pending in this application, of which claims 18-20, 22, 24-26 and 28 have been amended. No new claims have been added.

Before turning to the cited references, a brief review of the claimed invention is in order.

According to the present invention, a first exposure of a first time period is carried out first, and then a second exposure of a second time period which is shorter than the first time period is carried out. First electric charges generated by the first exposure are read out from first light-receiving elements intermittently present in a vertical direction to a vertical transfer register. Second electric charges generated by the second exposure are read out from second light-receiving elements intermittently present in the vertical direction and respectively assigned to vacant transfer areas in which no electric charge is present to the vertical transfer register. The first electric charges and second electric charges are alternately arranged on the vertical transfer register. In other words, the first electric charges and second electric charges are interchanged repeatedly and regularly with one another in place. Such first electric charges and second electric charges are outputted from an imager by a vertical transfer operation and a horizontal transfer operation.

Reading the first electric charges from the first light-receiving elements intermittently present in a vertical direction and reading the second electric charges from the second light-receiving elements intermittently present in the vertical direction allow an interline transfer-type imager to be applied to the present invention. That is, the present invention is able to create a combined image signal having an improved dynamic range and frame rate using an interline

transfer-type imager.

Claims 18-20 and 24-26 stand rejected under 35 USC §103(a) as unpatentable over U.S. Patent 5,694,167 to Hashimoto (hereinafter "Hashimoto") in view of U.S. Patent 6,130,420 to Tanaka, et al. (hereinafter "Tanaka et al.").

Applicants respectfully traverse this rejection.

Hashimoto discloses an image pick up device having a plurality of rows of light receiving cells, a plurality of vertical transfer registers each located adjacent to respective one row of light receiving cells and a control circuit for controlling said light receiving cells and the vertical transfer registers. The control circuit makes the light receiving cells and the vertical transfer registers carry out a short exposure operation and a long exposure operation continuously, and then reads out both signals sequentially or in parallel to synthesize an expanded dynamic range signal.

In contrast to the present invention, the imager disclosed by Hashimoto is a frame-interline transfer-type imager having a storage area. Such an imager is able to transfer the first electric charges obtained by the first exposure at a high-speed. Accordingly, even if the second time period for the second exposure is shorter than the first time period for the first exposure, the second electric charges obtained by the second exposure never interfere with the first electric charges. For that reason, neither the first electric charges nor the second electric charges are read out to the vertical transfer register in the above-described intermittent manner, and whereby the first electric charges and second electric charges not alternately arranged on the vertical transfer

register. Furthermore, Hashimoto fails to disclose or remotely suggest anything about such the reading/transferring of the electric charges, as the present invention.

The Examiner has admitted that Hashimoto fails to disclose that the "first reading signal reads out the light-receiving elements intermittently in a vertical direction," but has cited Tanaka et al. for teaching this feature.

Applicants respectfully disagree.

Tanaka et al. discloses a solid state image sensing apparatus comprising: a solid state image sensing device operated selectively either in an all-pixel read-out mode in which signal charges of all pixels represented by the devices are read therefrom individually at the same time, or in a thinned read-out mode in which the signal charges are read only from part of vertical pixel columns formed by the devices; and a frequency varying unit for varying a driving frequency of the solid state image sensing device depending on the operating mode in effect.

Tanaka et al. fails to disclose or suggest a plurality of times of exposure and transferring of the electric charges obtained by such an exposure, as in the present invention.

Furthermore, the combination of Hashimoto and Tanaka et al., fails to teach, mention or suggest alternately arranging the first electric charges and the second electric charges on the vertical transfer register, as in the present invention.

Accordingly, claims 18 and 24 have been amended to recite this distinction and the 35 USC §103(a) rejection should be withdrawn.

Claims 21 and 27 stand rejected under 35 USC §103(a) as unpatentable over Hashimoto

in view of Tanaka et al. and further in view of Japanese Publication 09-298685A to Uejima, et al. (hereinafter "Uejima et al.").

Applicants respectfully traverse this rejection.

Uejima et al. has been cited for teaching that the camera includes a monitor for displaying the image based on the first image signal but, like the other cited references, fails to teach, mention or suggest the alternate arrangement of the first and second electric charges in the vertical transfer register, as recited in the amendments to claims 18 and 24, from which claims 21 and 27 depend.

Thus, the 35 USC §103(a) rejection should be withdrawn.

The Examiner has indicated that claims 22-23 and 28-29 would be allowable if rewritten in independent form. Applicants respectfully defer this action until a FINAL Office Action, if any, is received.

In view of the aforementioned amendments and accompanying remarks, claims 18-29, as amended, are in condition for allowance, which action, at an early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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